s18quiz: EXP LOG (SLTN v227)
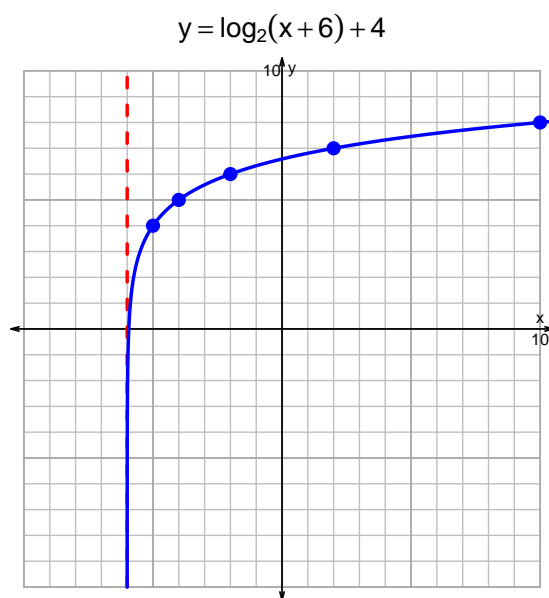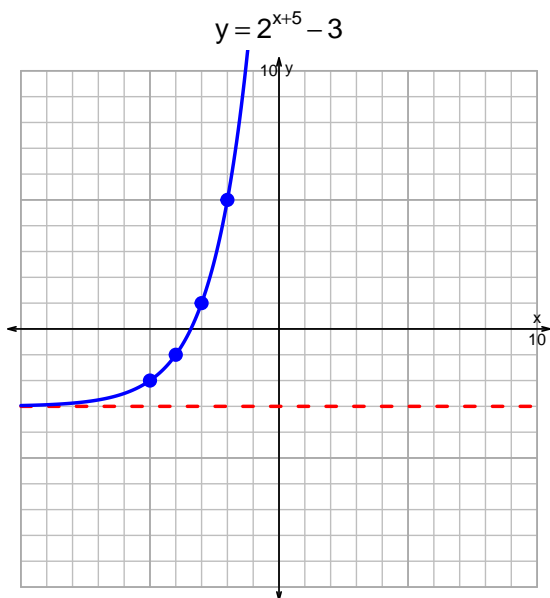
1. Graph $y = 2^{x+5} - 3$ and $y = \log_2(x+6) + 4$ on the grids below. Also, draw any asymptotes with dotted lines.

$y = 2^{x+5} - 3$

$y = \log_2(x+6) + 4$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-17 = \left(\frac{-3}{4}\right) \cdot 2^{5t/7}$$

Divide both sides by $\frac{-3}{4}$.

$$\frac{17 \cdot 4}{3} = 2^{5t/7}$$

Take log, base 2, of both sides.

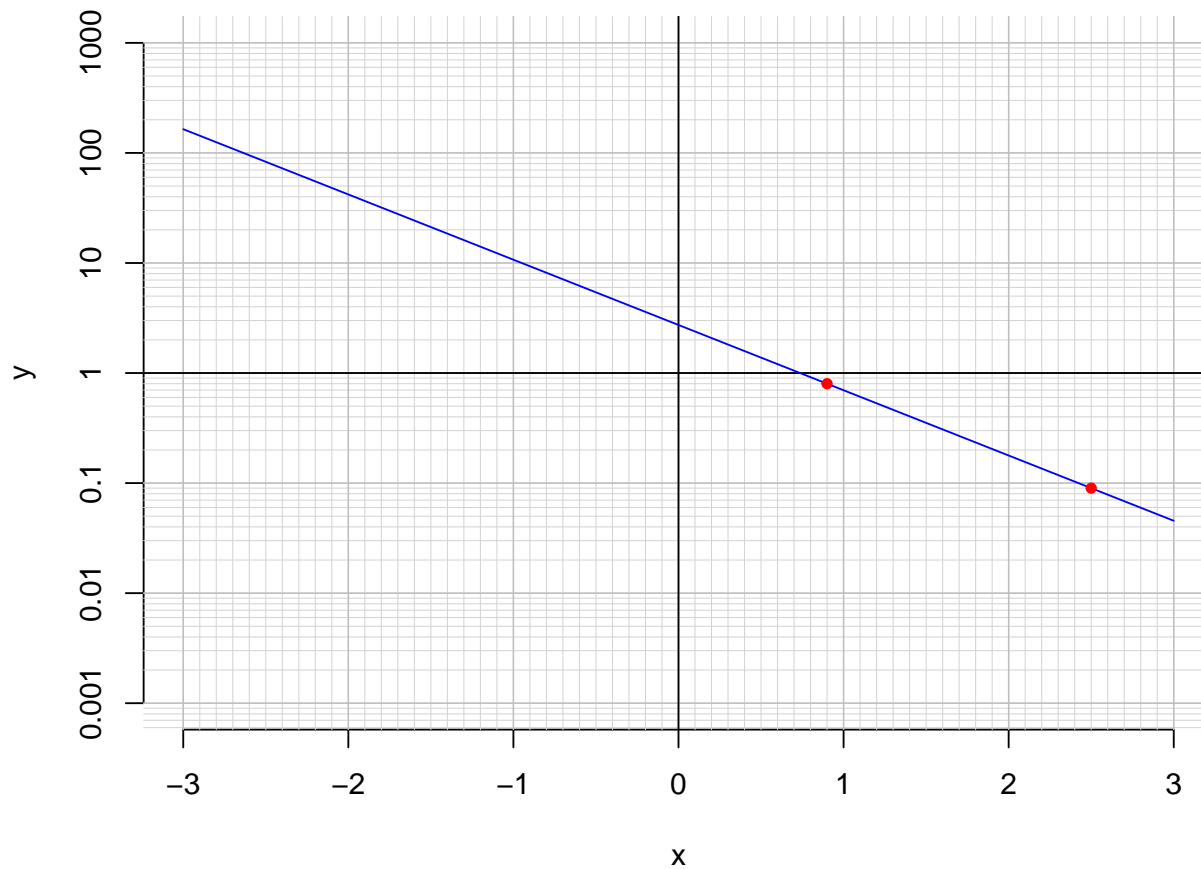$$\log_2\left(\frac{17 \cdot 4}{3}\right) = \frac{5t}{7}$$

Divide both sides by $\frac{5}{7}$.

$$\frac{7}{5} \cdot \log_2\left(\frac{17 \cdot 4}{3}\right) = t$$

Switch sides.

$$t = \frac{7}{5} \cdot \log_2\left(\frac{17 \cdot 4}{3}\right)$$

3. An exponential function $f(x) = 2.73 \cdot e^{-1.37x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(0.9)$.

$$f(0.9) = 0.8$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{1.37} \cdot \ln\left(\frac{x}{2.73}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.09)$.

$$f^{-1}(0.09) = 2.5$$